tation of the eclipse of 1239, it was suggested that this phenomenon might deserve further examination in connection with the eclipse of 1241, which had been already calculated by Hansen. The present memoir contains a very careful and complete discussion of the two eclipses, employing Leverrier's tables for the sun, and Hansen's lunar tables, except that the last values for the terms involving the square of the time, given by Hansen in "Darlegung der theoretischen Berechnung der in den Mondtafeln angewandten Störungen," Part 2, are substituted for the values adopted in the tables. The position of the belt of totality in the eclipse of 1241, in its passage across Germany, is very well defined by the statements of contemporary writers, taken chiefly from the great work of Pertz, "Monumenta Germaniæ Historica;" Prof. Schiaparelli had been similarly successful in laying down the actual track of totality across Italy in the eclipse of 1239, from the Records in Muratori's collection of Italian writers. In both cases totality is assumed to have taken place, when there is distinct mention of stars having appeared, which is about the only criterion that has value at these distant times. We shall probably revert to the subject of Prof. Celorai's able memoir.

NOTES

MANY geologists who have visited the Philadelphia Exhibition and seen the geological collections there have been impressed with the importance of having as nearly complete a collection as possible on exhibition, of geological specimens, maps, and sections, in accordance with a previously arranged plan. The International Exhibition to be held at Paris in 1878 will furnish such an occasion, and it is proposed to invite to that end governmental geological surveys, learned societies and private individuals throughout the world, to send to Paris such collections as will make the geological department of that exhibition as complete as possible. In order to take advantage of the collections which may thus be brought together, it is moreover proposed to convoke an International Geological Congress, to be held at Paris at some time during the Exhibition of 1878, and to make that Congress an occasion for considering many disputed problems in geology. In accordance with this plan it is proposed that the Geological department of the International Exhibition of 1878 shall embrace:—1. Collections of crystalline rocks, both crystalline schists and massive or eruptive rocks, including the so-called contact-formations and the results of the local alteration of uncrystalline sediments by eruptive masses. 2. Collections illustrating the fauna and the flora of the Palæozoic and more recent periods. 3. Collections of geological maps, and also of sections and models, especially such as serve to illustrate the laws of mountain structure. In pursuance of the above plan the American Association for the Advancement of Science during its annual meeting at Buffalo, appointed a Committee to carry out this scheme, to which were added the names of Prof. Huxley, Dr. Otto Torell, and Dr. E. H. von Baumhauer. Prof. James Hall was elected chairman, and Dr. T. Sterry Hunt, secretary. It was then resolved to prepare a circular to be printed in English, French, and German, and distributed to geologists throughout the world, asking their co-operation in this great work of an International Geological Exhibition and an International Geological Congress to be held at Paris in 1878; the precise date of the Congress to be subsequently fixed. All those interested in this project are invited to communicate with any one of the following members of the Committee:—Prof. T. H. Huxley, London, England; Dr. Otto Torell, Stockholm, Sweden; Dr. E. H. von Baumhauer, Harlem, Holland; Dr. F. Sterry Hunt, Boston, Mass., U.S.A.

AT a recent meeting of the Literary and Philosophical Society of Manchester, Prof. Osborne Reynolds, in justly animadverting on the large type sensation headings in which some newspapers announced what, in their perversity or ignorance, they called the "failure" of the Arctic expedition, showed that in truth the expedition had been one of the finest achievements ever accomplished. Looked at boldly, it comes to this. Since Hudson's time, more than 200 years ago, Arctic navigators had succeeded in penetrating about sixty or seventy miles of the 540 to be passed before the Pole could be reached. Whereas Capt. Nares has, in one year, carried the British flag some sixty miles nearer, so that nearly one half, and this by far the most difficult half, of the entire results of all expeditions since Hudson's time has been accomplished by the last. And this is not all. Capt. Nares seems to have pursued the journey to its end, at least by that route; and in coming back can say that he did not leave a single uncertainty behind him. So far, therefore, from having been a failure, this has been the most successful expedition ever sent out.

IT is expected that the French Government will ask our Admiralty to establish an Arctic department in the Exhibition of 1878, in which all the relics of English Arctic exploration will be collected and exhibited, as well as all the Parliamentary papers and publications relating to the subject.

M. CHEVREUL was entertained at dinner the other day at the Café Corazza, in the Palais Royal, by eighty *savants* in celebration of the fiftieth anniversary of his professorship and membership of the Academy of Sciences. M. Chevreul, now the oldest member of the Academy of Sciences, is ninety years old, and enjoys perfect health and mental vigour. The most notable instances of academical longevity have been Fontanelle, one of the perpetual secretaries, who died in 1742, aged close on 100 years; M. Biot, who lived ninety-two years, and preserved to the end of his days his mental powers; M. Mathieu, who died March 5, 1875, was also a nonogenarian, and the *Annuaire du Bureau des Longitudes* for 1875 was edited by him. He had succeeded in 1817 Messier, an astronomer, who was an Academician during more than forty years, so that the same seat had only two occupants in a whole century.

A SERIES of lectures is now being given by eminent men of science, explanatory of the instruments in the Loan Collection of Scientific Apparatus at South Kensington. The lectures are free, and working men are invited to attend. The lectures at present arranged for are as follows:—Saturday, November 25, Prof. W. Leith Adams, F.R.S., on "Extinct Animals," as represented by magic lantern slides and specimens in the loan collection. Saturday, December 2, J. S. Gardner on "The Collection of Fossil Leaves." Saturday, December 9, J. Norman Lockyer, F.R.S., on "The Spectroscopes in the Collection." Saturday, December 16, Prof. Huxley, F.R.S., on "The Systematic Teaching of Biology." The lectures will be delivered in the Lecture Theatre of the South Kensington Museum at eight o'clock P.M.

PROF. HUGHES read a paper before the Cambridge Philosophical Society last Monday, in which he criticised the evidence offered to support the view that man existed on the earth during or before the glacial period. He first reviewed several of the older cases which had been put forward, and tried to show that the evidence was always incomplete, or that its trustworthy character disappeared on closer examination. Coming to the two more recent and important instances of human remains or implements being found beneath glacial beds or in beds older than the glacial, Prof. Hughes gave his opinions from personal inspection and acquaintance with the localities. The human fibula found under glacial till in Victoria Cave, Settle, with *Elephas antiquus*, *Rhinoceros leptorhinus*, &c., had been regarded as decisive. Mr. Tiddeman (NATURE, vol. xiv. p.

506) says, "The Settle till is undoubtedly of the age of the ice-sheet." Prof. Hughes said that although the boulder clay at the mouth of the cave had got rather underneath the brow of the hill, yet from intimate knowledge of the physical nature and conditions of the district, which he had himself mapped, he saw no impossibility in the idea of the boulder clay having tumbled from the cliff above during the process of wearing back. Very often the upper limestone was so dissolved as to form pockets into which the boulder clay was let down, and then when an escarpment was disintegrated, he could quite conceive how such a pocket was thrown obliquely against the mouth of the cave in post-glacial times. This had ponded back the water that came into the cave, and necessarily produced a stratified deposit, in which the remains in question were found. With regard to the evidence brought forward by Mr. Skertchley, of the occurrence of palæolithic implements in brick earth beneath the chalky boulder-clay at Thetford, near Brandon, he had visited the locality, and his opinion was that in each case there was a missing link in the proof that the clay beneath which the implements were found was identical with clay at no great distance which was indubitable boulder-clay. In fact, there were many indications of the opposite. Local conditions in denudation, solution of chalk, formation of the valleys, &c., were abundantly present to mask the true state of things. The proof in this case was certainly not cogent; and it must be cogent to be accepted.

WE are glad to be able to confirm the report which appeared in our columns a short time ago that the Goldsmiths' Company had promised to contribute 1,000*l.* to the Chemical Society's Research Fund. This sum has now been handed over to the society and raises the amount of the fund already received to 3,050*l.*, a sum which we hope will be still further largely increased.

IN a communication to the St. Petersburg Society of Naturalists, Prof. Fr. Schmidt sketches the Tertiary formations on the northern shores of the Pacific as follows:—The formation consists of two stages. The Lower is a continental Miocene deposit with coal-seams and numerous plants, the complete description of which will soon appear by Dr. Oswald Heer. This deposit has a very wide extent, having been found in the middle parts of the Amoor basin, on the Sakhalin, in Kamtchatka, Alaska, and on Vancouver Island; and nearly the same rich flora which it contains can be traced as far as the Mackenzie River, Greenland, and Spitzbergen. An immense continent between North-eastern Asia and North-western America must thus have existed at this epoch, and its flora shows the prevalence of a far warmer climate than now, probably like that which the middle parts of the United States now enjoy. The Upper Tertiary stage is a marine Pliocene deposit with numerous remains of molluscs, and it was observed on the Sakhalin Island (but wanting at the same time on the closely-adjacent Siberian continent), in Kamtchatka, on the Aleutian Islands, in Oregon, U.S., and in California. Notwithstanding their varied lithological characteristics, these deposits contain a remarkably uniform fauna. The number of species already described by Prof. Schmidt, on the basis of large collections made during the last thirty years, is eighty, out of which eighteen have no living representatives, six inhabit only the Polar Sea and the Northern Atlantic, and the remaining fifty-six still inhabit the Northern Pacific. Out of the eighteen extinct forms six were already found in the Tertiary of Oregon and California, and one of them (*Nucula ermani*, Girard) will probably prove to be the same as the *N. cobboldiæ*, Sow., of the English Crag. Generally, during the Pliocene epoch, the faunas of the northern parts of the Pacific and the Atlantic were far more alike than now, and it must be supposed that the connection between both oceans through the Polar Sea was far closer than now, a supposition supported also by the close likeness of some forms inhabiting the Pacific and the Atlantic shores of Northern America. Their close likeness, which appears so strange when we learn that they do not now inhabit the Polar Sea, is perfectly explained when we find them in a fossil state in the Pliocene deposits of the far north, as was the case with the *Pholas crispata* and the *Pectunculus pilosus*, which were found fossil, the former on the Northern Dwina and Jenissei, and the second on the Kadiak Island. The fossil fauna of the Arctic regions thus explains the present distribution of forms. Prof. Schmidt expresses the wish that the Pliocene deposits of these regions were thoroughly explored as soon as possible.

AT the meeting of October 21 of the Geological Section of the St. Petersburg Society of Naturalists, Prof. Friedrich Schmidt made an interesting communication on the Post-Glacial Period in Esthonia. Starting from the supposition—which he supports in common with Swedish and Finnish geologists—that Esthonia was covered during the Glacial period with an ice-sheet which concealed it with Scandinavia, Finland, Northern Russia, reaching probably the southern slope of the Waldai plateau, Prof. Schmidt proved that after the melting of the ice the country was covered with numerous immense laxes. The land was then submerged by the sea, but only to a small extent, as notwithstanding many years' careful researches, formations with marine fossils have not been found in Esthonia further than 30 kilometres distant from the Gulf of Finland, nor on levels higher than 60 feet above the sea. They are Post-Glacial, containing a fauna which, with very few exceptions, inhabits now the Baltic. After the submergence the land rose to its present height, but this elevation was probably accomplished during pre-historic times. At least, M. Schmidt states, contrary to the assertions of MM. Baer, Hofmann, and others as to the present rising of all the islands of the Gulf of Finland, there was not in Esthonia evidences of the rising of the land during the last four centuries which could be accepted as unmistakable. It may be remarked that the conclusions of Prof. Schmidt as to the small submergence of Esthonia, however contradictory of current opinions are also supported by the circumstance that marine formations were not found in Eastern Sweden above a level of 100–120 feet; and that in Finland the traces of marine clays (with *Cardium edule* and *Tellina balthica*) totally disappear at a level higher than 62 feet. These negative evidences have some weight, both countries having been well explored along some parts of their coasts.

AT the meeting of the Literary and Philosophical Society of Manchester, on October 17, Mr. Baxendell drew attention to the paper "On the Protection of Buildings from Lightning," read by Prof. J. Clerk Maxwell at the late meeting of the British Association at Glasgow, and stated that the system of protection recommended by the professor, and which he appears to have regarded as new, was suggested, and its adoption strongly advocated, nearly forty years ago by the late Mr. Sturgeon, whose many valuable contributions to electrical and magnetical science seem to have been strangely overlooked by recent investigators and writers. The paper in which the system was first described was read before the London Electrical Society on March 7, 1838, and an abstract of it was published in the second volume of the "Annals of Electricity." There is, however, one important difference between the two systems. Mr. Sturgeon considered it necessary that the copper sheathing or covering of a protected room or powder magazine should be well connected with the ground; but Prof. Maxwell is reported to have stated that "there would be no need of any earth connection. They might even place a layer of asphalte between the copper floor and the ground, so as to insulate the building." It is obvious, however, Mr. Baxendell states, that if the magazine were struck by lightning, a disruptive discharge through the layer of asphalte would in all probability take place, which might rupture the copper sheathing, and thus ignite the contents of the magazine; but by the adoption of Mr. Sturgeon's plan an accident of this kind could not occur.

Her Majesty has commanded that instructions be given to the Master of the Mint to prepare a die and cast a sufficient number of medals commemorative of the Arctic Expedition. These are to be distributed amongst the officers and crews of the *Alert*, the *Discovery*, and the *Pandora*. The Lord Mayor, Sir Thomas White, is to give a dinner to the crews of the *Alert* and *Discovery* at the Mansion House, on the evening of December 5. The Lord Mayor intends to invite the officers of the expedition to a banquet a few days later, probably December 8. The inhabitants of Portsmouth intend to entertain the crews of the *Alert*, *Discovery*, and *Pandora* at a dinner on the 30th inst.

Mr. R. J. Friswell has resigned the honorary secretaryship of the Photographic Society.

The Ethnographical Museum of Berlin has lately received several valuable additions, viz., the objects acquired by Dr. Lenz during the German-African Expedition. They represent tribes from the West Coast of Africa hitherto little known, and consist of various wooden weapons, domestic implements and musical instruments. Very shortly the excellent collections of the celebrated African traveller, Dr. Nachtigal, are also to be exhibited at the museum. Some of these come from tribes which Dr. Nachtigal was the first European to see. Much inconvenience is felt at the museum through want of space, and particularly so with reference to some American curiosities sent for exhibition by Prof Bastian.

St. John's College, Cambridge, offers for competition an exhibition of 50*l*. per annum, for proficiency in Natural Science. The examination will commence on Saturday, April 7, and will be in chemistry, including practical work in the laboratory; Physics, viz., Electricity, Heat, and Light; and in Physiology Candidates will also have the option of being examined in Geology, Comparative Anatomy, and Botany, provided they give notice of the subjects in which they desire to be examined four weeks prior to the examination. No candidate will be examined in more than three of these six subjects, whereof one at least must be chosen from the former group. It is the wish of the master and seniors that excellence in some one department should be specially regarded by the candidates. Names should be sent to one of the tutors at least fourteen days before the examination.

A chair of Physical Astronomy has been created in the Faculty of Sciences at Lyons.

How rapidly an interest in prehistoric researches is spreading among the educated classes in Germany is seen in the progress of the Anthropological Society of Munich. It was constituted in 1870 as a branch of the German Anthropological Society, founded only three weeks before it. It began with thirty-five members and now numbers 300.

The present efforts of the German Anthropological Society are directed towards the preliminary preparations for an Anthropological and Primitive History of Germany; by means of a territorial division of labour, extremely important data have already been obtained. Contributions on particular points are appearing in the *Correspondenzblatt* of the German Anthropological Society, the *Archiv für Anthropologie*, and the Berlin *Zeitschrift für Ethnographie*. Meantime, at the Anthropological Meeting held in Munich last year, a plan was formed by a number of Anthropologists, in reference to the astonishing richness of the prehistoric discoveries in Bavaria, for the advancement of German Anthropology, by the establishment of an organ for the publication of the complete results which have been obtained in reference to Bavaria. The accomplishment of this scheme has now commenced with the publication of a part of the *Beiträge zur Anthropologie und Urgeschichte Bayerns*, an organ of the Munich Society of Anthropology. This part contains a monograph on the "Lake Dwellings in the Würm See," by S. v. Schab, who has thoroughly explained this prehistoric dwelling-place, and collected and arranged the rich finds. The most important of the latter are shown in seventeen lithographic plates, partly coloured, with maps, plans, &c.

The *Daily News* Alexandria correspondent sends to that paper, November 21, some particulars of the life and work of an African explorer who has been quietly doing good service for many years. This is Signor Piaggia, who went to Tunis first in 1851 as a gardener, and there and in Alexandria saved money for years, with which he went up to Khartoum. From then until now he has made several important journeys; to the country of the "Kieks," the territory of the Niam-Niams, where he became a great favourite, and stayed more than two years, the Bogos territory on the borders of Abyssinia with the Marquis Antinori, into Cerada, south-east of Lake Tzana, which he explored minutely. Latterly, after accompanying Gessi for some distance, he has been in the districts of Mrouli and Mtesa, and made a thorough exploration of the Lake Capechii. From all his journeys he has brought back large collections of objects of all kinds, which, it is believed, are now for sale.

The *Moniteur de l'Algérie* states that from November 8 a violent sirocco, or wind from the desert, was felt in Algeria for several days. This accounts for the unusual elevation of temperature in Algeria.

The exhibition of fossils, paintings, plants, and other objects illustrative of the mountain limestone in the Manchester Aquarium, was closed on Monday, having been open to the public a little more than a week. The exhibition has been in every way successful.

Further details received regarding the cyclone of October 31 prove it to have been one of the most terrible calamities on record. Estimates based on official returns from each police section put the loss of life in the districts of Backergunge, Noakholly, and Chittagong at not less than 215,000. Three large islands—Dakhin Shahabazpore, Hattiah, and Sundeep—and numerous small islands were entirely submerged by the storm wave, and also the mainland for some five or six miles inland. These islands are all situated in or near the estuary of the Meghna, a river formed by the confluence of the Ganges and Brahmapootra rivers. Up to 11 P.M. on the night of the catastrophe there were no signs of danger, but before midnight the storm wave swept over the islands to a depth in places of 20 feet, surprising the people in their beds. The country is perfectly flat, and, therefore, trees were the only secure range. Almost every one perished who failed in reaching trees. A strange fact about the disaster is that in Dakhin Shahabazpore and Hattiah most of the damage was done by the storm wave from the north sweeping down the Meghna. Several theories, the *Times* Calcutta correspondent states, have been started to account for this. One is that the cyclone, forming in the bay, struck the shore first near Chittagong, and went north for some distance, and then turned southward again. Another is that the wind blew back the waters of the Meghna, which rebounded with terrific force when the pressure relaxed. A third supposition is that there were two parallel storms with a centre of calm between them. The first or third theory seems most probable, as in Sundeep and Chittagong the destruction came from the south.

Mr. Henry Meiggs, the well-known American railroad contractor and engineer, whose efforts in connection with the establishment of railroads in Peru are so well known and appreciated, has recently furnished the means to M. Bur, a

French ethnologist, for carrying on some explorations in the vicinity of Tiahuanuco, in Bolivia, a region which abounds in objects of archæological interest. Mr. Meiggs has arranged that a full series of these objects shall be presented to the U.S. National Museum.

A VALUABLE entomological collection has been presented to the Oxford University Museum by Mrs. Tylden, the relict of the late Rev. W. Tylden, formerly of Balliol College. The collection numbers 23,518 specimens, arranged in cabinets.

PROF. PALMIERI, Director of the Observatory on Mount Vesuvius, has been made an Italian Senator.

A DESPATCH received at Rome from Aden, November 19, states that the Italian African Expedition has arrived in Shoa.

THE Government Resident at Somerset has telegraphed to the Colonial Secretary that Messrs. D'Albertis, Hargrave, and party have returned safely from their expedition to the Fly River. They ascended the country a distance of 350 miles above the spot reached by the expedition party of last year. They were unable to communicate in any way with the natives who were very numerous and hostile.

A SIXTH edition of Prof. Page's well-known "Advanced Text-Book of Geology" has been published. The work has been enlarged "to embrace whatever is new and important in the science, to afford space for additional illustration, and to combine, as far as possible, the principles with the deductions of geology."

WE have on our table the following books:—Preliminary "Report on the Forests of Pegu," by Sulpice Kurz (Calcutta). "The Aquarium," J. E. Taylor (Hardwicke and Bogue). "Spiritualism and Animal Magnetism," Dr. Zerffi (Hardwicke and Bogue). "The Theory of Colour," Dr. W. von Bezold (Trübner). "The Art of Retouching," Burrows and Colton (Marion). "Science in Sport made Philosophy in Earnest," by Robert Routledge (George Routledge and Sons). The ninth edition of "Kirke's Physiology," edited by Morrant Baker (John Murray). "Between the Danube and the Black Sea," H. C. Barkley, C.E. (John Murray). The fourth edition of Wanklyn's "Water Analysis" (Trübner). "Demonstrations of Microscopic Analysis," Harley and Brown (Longmans). "Mushrooms and Toadstools," Worthington G. Smith (Hardwicke and Bogue). "Geological Observations," Charles Darwin, F.R.S. (Smith, Elder, and Co.). "Lessons in Electricity," John Tyndall, F.R.S. (Longmans). "Our Birds of Prey," The Raptores of Canada, H. G. Vennor (Sampson Low and Co.).

THE additions to the Zoological Society's Gardens during the past week include two Prussian Carp (*Carassius vulgaris*), European, presented by Lord Arthur Russell, F.Z.S.; a Bubaline Antelope (*Alcelaphus bubalinus*), an Addax Antelope (*Addax naso-maculatus*) from North Africa, a Buff-breasted Partridge (*Ptilopachys ventralis*) from West Africa, four Brazilian Cormorants (*Phalacrocorax brasiliensis*) from Brazil, purchased; a Macaque Monkey (*Macacus cynomolgus*) from India, a Chilian Sea Eagle (*Gerangäetus aguia*) from South America, deposited; a Hairy-rumped Agouti (*Dasyprocta prymnolopha*), born in the Gardens.

SCIENTIFIC SERIALS

Schriften der physikalisch-oekonomischen Gesellschaft zu Königsberg (1875, 1 and 2).—These parts, amongst a number of smaller papers and notes, contain the following more important treatises:—On the determinations of temperature in the soil at different depths at the station at Königsberg, by Prof. E. Dorn.—Observations on the genera of *Nematidæ*, by C. G. A. Brischke and Prof. Dr. G. Zaddach. This paper occupies more than half of Part 1.—On the temperature in the interior of animal bodies, by Dr. Adamkiewicz.—On a new species of Algæ, *Merismopedium Reitenbachii*, Casp., by Prof. Caspary.—On the different forms of the stigmatic disc of *Nuphar luteum*, Sm., by the same.—On the latest investigations made by M. Lassaulx on earthquakes, by O. Tischler.—On the so-called "Moosbrüche," specially on the "Zehlaubruch," near Tapiau, by Herr Stiemer.—On the courses of rivers," &c., in the North German plains during the Diluvial period, by Prof. Berendt.—On one of Euler's geometrical problems, by Dr. Saalschütz.—On the courses of rivers in the province of Prussia, by Herr Stiemer.—On the Colorado beetle, by Dr. Schiefferdecker.—On reflectors, by Dr. Berthold.—On Gore's rotating ball, by Herr Momber.—On the artificial production of colours from the white of eggs, by Dr. Adamkiewicz.—On Phylloxera, by Dr. Benecke.—On the oscillations of *terra firma*, by Dr. A. Jentzsch.—New list of Prussian beetles (fourth paper), by Dr. Lentz. The author makes the total of different species to the number of 3,216!—On old Prussian "Kjökken Möddings" at the coast of the "Frische Haff," by Prof. Berendt.—On the conception of value in the different theories of the same, by Adolf Samter.—On the power of accommodation amongst plants and insects, by Dr. G. Czwalina.—On an erratic block-limestone found near Tilsit, by Dr. Friederici.—On salicylic acid, by Prof. Samuel.—Archæological researches on the "Kurische Nehrung," by O. Tischler.—On an alleged proof of the early existence of man in Europe, by Dr. Jentzsch.—On an unusually large fungus, *Agaricus suffructicosus*, by Prof. Caspary.—The Appendix contains the report sent by the Society to the Provincial Landtag on its geognostical researches in the province of Prussia.—The parts further contain a memoir of the late Prof. Argelander, of Bonn, by Dr. Luther.

SOCIETIES AND ACADEMIES

LONDON

Mathematical Society, November 9.—Prof. H. J. S. Smith, F.R.S., president, in the chair.—Mr. J. W. L. Glaisher communicated a note on certain identical differential relations.—Mr. Tucker read parts of papers by Mr. Spottiswoode on curves having four-point contact with a triply-infinite pencil of curves, and by Mr. E. B. Elliott on some classes of multiple definite integrals.—In a paper published in the *Mathematische Annalen* (vol. iii. p. 459) Brill has investigated the case of curves having three-point contact with a doubly infinite pencil of curves; and in the same journal (vol. x. p. 221) H. Krey, of Kiel, has applied a method, similar to that of Brill, to the next step in the problem proposed in Mr. Spottiswoode's paper. He does not, however, appear to have succeeded in completely eliminating the differentials which occur in the process; and in that respect his solution is incomplete. Some formulæ used in Mr. Spottiswoode's paper on the contact of curves and surfaces, and in particular in that on the sextatic points of a plain curve (*Phil. Trans.*, 1865, p. 657), prove to be directly applicable to the question. An application of them to Brill's problem will be found in a paper in the *Comptes Rendus* (1876).

Astronomical Society, November 10.—Mr. Huggins, president, in the chair.—The Astronomer-Royal gave a short account of the proceedings of the Royal Observatory during the recess, describing the lunar and physical observations which had been assiduously prosecuted and the state of the calculations for his new lunar theory.—A paper by Prof. Langley, of the Allegany Observatory, Pennsylvania, on the measurements of the direct effects of sun-spots on terrestrial climates was read. Prof. Langley has made experiments to determine the difference in the amount of heat radiated from the centre of a sun-spot and from an equal area of penumbra and photosphere. Combining these results with the amount of the sun-spot area given as existing during a period of maximum of sun-spot frequency in the tables of Messrs. De la Rue, Stewart, and Lœwy, he calculated that the mean terrestrial temperature due to solar radiation at a period of sun-spot minimum would be something between three-tenths and one-twentieth of 1° C. greater than at a period of sun-spot maximum. The Astronomer-Royal pointed out that the observations of underground temperature made at the observatories at Paris, Edinburgh, and Greenwich showed differences in the mean annual temperature of the surface soil which amounted to as much as 6° F. An examination of the temperatures at different depths showed that the differences of surface temperature had their cause in something external to the earth, but he had not found that the differences of mean surface temperature coincided with the variations in the amount of the English serial crop as given by the Board of Trade returns or with the periods of sun-spots maxima. Mr. De la Rue said that it did not follow that the